INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(54) Title: METHOD OF TRACKING AND SENSING POSITION OF OBJECTS

(57) Abstract

A spatial position and orientation sensor based on a three–dimensional imaging system provides information describing the actual three–dimensional spatial position relative to the sensor of objects in the field of view of the sensor. The sensor thus directly determines its location relative to its surroundings. Movement of the sensor, and thus movement of an object carrying the sensor, relative to the surroundings is detected by comparing repeated determinations of the location in three dimensions of fixed features in the surroundings relative to the sensor. An algorithm is used to calculate changes in the position of features in the field of view of the sensor relative to the sensor. Knowledge of changes in position relative to fixed features is used to determine movement in three dimensions of the sensor or an object carrying the sensor relative to the fixed features in the surroundings. The features in the surroundings may be natural or artificial. The true extent of the movement of the sensor in three dimensions is directly determined from the change in position and orientation of the sensor relative to the fixed features in the surroundings. The extent of the movement is used to determine the new position and orientation of the sensor relative to a previous position. When starting from a predetermined location the actual position and orientation of the sensor may be reliably tracked over a period of time by accumulating the measured movements over that time.